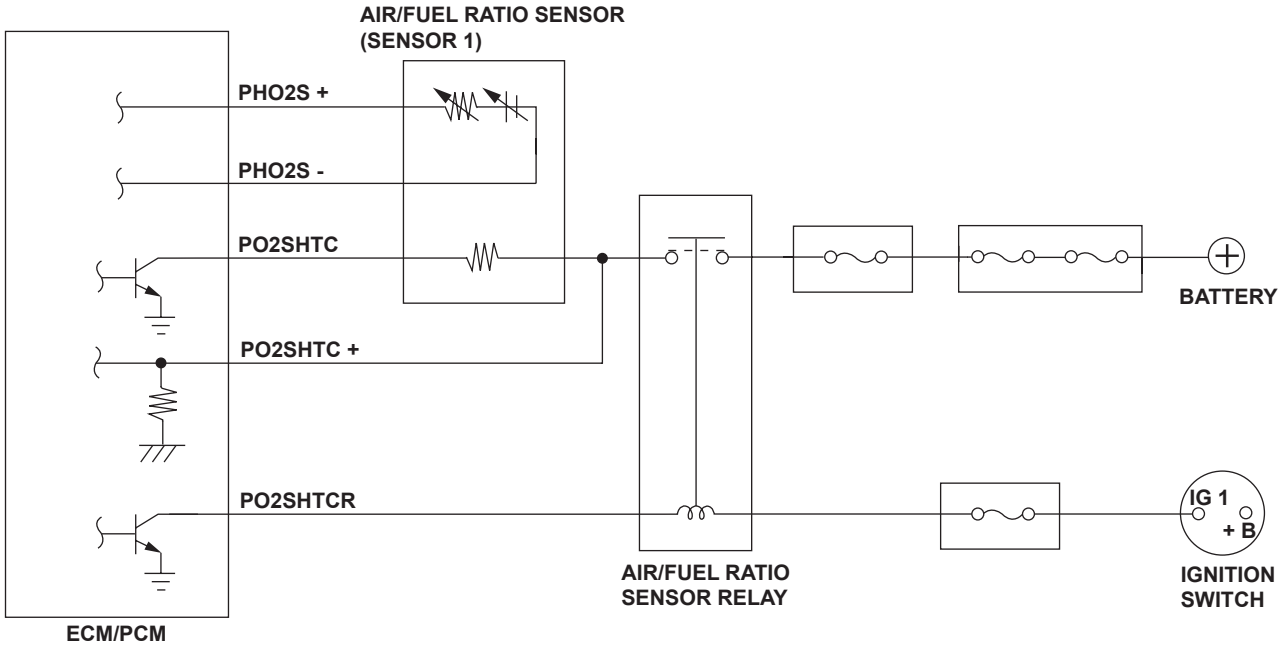
DTC P1162: Air/Fuel Ratio (A/F) Sensor (Sensor 1) Circuit Malfunction



P1162-9801

General Description

The air/fuel ratio (A/F) sensor (sensor 1) is installed in the exhaust system and detects oxygen content in the exhaust gas. The A/F sensor transmits output voltage to the engine control module (ECM)/powertrain control module (PCM). A heater for the sensor element is embedded in the A/F sensor (sensor 1). It is activated and heats the sensor to stabilize and speed the detection of oxygen content by controlling current flowing through the heater. An increase in the current levels off as the applied voltage to the element electrode reaches a certain range because the amount of oxygen which is led through the diffusion layer is limited. The current amperage is proportional to oxygen content in the exhaust gas, so the air/fuel ratio is detected by the measurement of the current amperage. The ECM/PCM compares a set target air/fuel ratio with the detected air/fuel ratio and controls the fuel injection timing.

If the A/F sensor (sensor 1) voltage is low, the air/fuel ratio is lean, and the ECM/PCM uses A/F feedback control to issue a Rich command. If the A/F sensor (sensor 1) voltage is high, the air/fuel ratio is rich, and the ECM/PCM uses A/F feedback control to issue a Lean command.

If the element is not activated or the ECM/PCM terminal voltage is a set value or less for at least a set time period when the power is drawn to the A/F sensor (sensor 1) heater, a malfunction is detected and a DTC is stored.

Monitor Execution, Sequence, Duration, DTC Type

Execution	Continuous
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL ON

Enable Conditions

Condition	Minimum	Maximum
Elapsed time after starting the engine	60 seconds	—
Engine coolant temperature	14ºF (-10ºC)	—
Battery voltage	9.7 V	16.0 V
No active DTCs	A/F Sensor (sensor 1)	

Malfunction Threshold

The A/F sensor (sensor 1) heater power is 25 W or more and the element resistance is 250 Ω or more for 5 seconds.
or, PHO2S+ or PHO2S- terminal voltage is 0.4 V or less for 3.9 seconds.

Driving Pattern

Start the engine. Hold the engine at 3,000 rpm with no load (in park or neutral) until the radiator fan comes on, then let it idle.

Diagnosis Details

Conditions for illuminating the MIL
When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM/PCM memory.

Conditions for clearing the MIL
The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.
The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.